Musculoskeletal injuries

''Underuse'' as a cause for musculoskeletal injuries: is it time that we started reframing our message?

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Promoting physical activity

Sports medicine clinicians need to be leaders in the field of physical activity promotion. As such, we must avoid language that inappropriately discourages exercise. Articles on musculoskeletal injuries typically divide the causes into either ''acute'' or ''overuse''. Both of these terms implicate activity as the basis for the musculoskeletal pain. However, as we learn more about the epidemiology, pathophysiology, treatment, and prevention of these injuries, it is clear that, in fact, inactivity may be the underlying cause of many of these conditions. ''Underuse injuries'' may be a more appropriate term to explain the aetiology of many conditions seen by those in the field of sports medicine.

THE OVERUSE OF THE TERM OVERUSE

A May 2006 Medline search for articles with the keyword ''overuse injuries'' registered 7649 ''hits'' over the past 40 years, and 3970 in just the past 10 years. The vast majority clearly suggest that overuse is the reason for the injury. To be fair, a search of ''underuse injuries'' reveals seven findings. However, none implicate ''underuse'' as the cause of the injury. For example, one article deals with underuse of imaging, another with the underuse of analgesia, and a third with the underuse of therapy.

Certainly patients report injuries after movement: ''I lifted a box, and then my back hurt,'' or ''I jogged three miles, and now my knee hurts.'' Were these injuries due to overuse, or were they in fact due to underuse followed by movement of the body in an unfamiliar manner? Clinicians and researchers may interpret the activity as the cause, and articles are often written assessing ''injuries'' with the implication that they were result of movement. This explanation, although sequentially accurate, neglects to focus on the fact that a lack of previous movement is more likely the true source.

EPIDEMIOLOGY OF MUSCULOSKELETAL INJURIES

Some studies of adolescents find increased musculoskeletal pain in those that are more active.[1 2] However, studies in adults find the opposite. A 14 year prospective longitudinal study of 961 men and women, aged 50 and over, found that ''exercise was associated with a substantial and significant reduction in pain even after adjusting for gender, baseline BMI, and attrition''. This was despite the fact that fractures, a significant predictor of pain, were slightly more common among the runners.[3] Several recent cross sectional studies in adults have found higher levels of physical activity to be associated with less pain and disability and a higher health related quality of life.[4–6] This is similar to studies of acute myocardial infarctions, which show that acute activity may trigger the event, but the long term risk is decreased by more activity.[7–10] The same holds true for the effects of physical activity on musculoskeletal injuries. Lifetime physical activity seems to be protective.

PATHOPHYSIOLOGY OF MUSCULOSKELETAL INJURIES

What have we learned about the pathophysiology of musculoskeletal injuries? Consider tendon injuries. These are ubiquitously referred to as ''overuse,'' even in the most reputable reviews which document that tendon degeneration is the primary pathology.[11 12] Eccentric muscle-tendon exercises have consistently shown superiority over rest for the treatment of tendon injuries.[13 14] If the tendons were injured because of overuse, what is the rationale behind even more use?

TREATMENT AND PREVENTION OF MUSCULOSKELETAL INJURIES

Similar to recommendations for tendinopathies, current treatment protocols for a variety of musculoskeletal injuries encourage movement over rest. The classic example for this involves back pain. Older recommendations advocated bed rest, but a recent Cochrane review shows no advantage and potential harm to rest in comparison with remaining active.[15] Similarly, a recent systematic review of the literature for treatment of upper and lower limb injuries consistently supported mobilisation over rest.[16]

Some may argue that sports medicine is the care of active individuals, and that athletes who over-train get injured more often. Thus, overuse is the proper term in ''sports medicine''. Certainly, there is an association between training volumes and increased risk of stress fractures in athletes.[17] However, consider current research for the prevention of injuries in athletes. A review focusing on hamstring injuries found a lack of strength to be a consistent risk factor.[18] Although it may be a low hamstring to quadriceps strength ratio that is the culprit, injury prevention programmes are focusing on increasing the hamstring strength, and not decreasing the quadriceps strength.[19] Similarly, studies to prevent ankle injuries and anterior cruciate ligament tears emphasise the need for neuromuscular training, not rest.[20–22]

SO WHAT?

Many countries are facing an epidemic of physical inactivity. Currently more than half of US adults do not participate in at least 30 minutes of moderate activity on most days of the week.[23] Among adolescents, 15% of boys and 22% of girls are inactive, as defined by reporting no episodes of vigorous physical activity per week.[24] Only 12% of youth originally achieving regular (five or more) bouts of physical activity remain active as young adults.[25] Total media time among youth in industrialised countries is estimated to be about five hours a day.[26]

We recognise that certain extremely active people may push their bodies outside of the theoretical ''envelope of homeostasis'' as described by Dye.[27] Still, for the general population, it seems prudent to try to raise that level of homoeostasis. A review of the current science implicates that too little activity over time may in fact be the primary cause of a large percentage of musculoskeletal injuries. Given the worldwide epidemic of obesity, and its association with physical inactivity,[28] it is clear that overuse/too much exercise is not a major public health problem. Those of us in the field of sports medicine should do what we can to promote physical activity and not further the message that exercise will cause you to hurt.

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